What is claimed as new and desired to be protected by Letters Patent is set forth in the appended claims.

CLAIMS

1. A system for treating serious infections and sepsis caused by infections by withdrawing blood from a patient, passing the withdrawn blood through a particulate hemocompatible polymer material for removing toxins, and returning the blood from which the toxins have been removed back to the patient, the system comprising the particulate hemocompatible material which includes a first group of macroporous particles which are hydrophobic and positively charged so as to provide adherence of endotoxin to an inner surface of particles of the first group, and also a second group of mesoporous particles which are hydrophobic and are not charged and have a pore size selected so that cytokines and superantigens adhere to an inner surface of the particles of the second group.

Sub B1

2. A system as defined in claim 1; and further comprising a container accommodating said particles of said first and second groups, and having an inlet and outlet for blood.

Sub C4

3. A system as defined in claim 1, wherein said particles are particles selected from the group consisting of beads and fibers.

4. A system as defined in claim 1, wherein the macroporous particles of the first group and mesoporous particles of the second group have a hydrophobic porous core part and a hydrophilic coating part providing a biocompatibility.

5. A system as defined in claim 3, wherein the macroporous particles of the first group have a hydrophobic core bearing positively charged groups on the surface of the pores.

6. A system as defined in claim 1, wherein said particles of said first group and said second group are intermixed with one another, so that blood passes through said intermixed bed of particles of said groups.

7. A system as defined in claim 1, wherein said groups of particles are located one after the other, so that blood passes first through the particles of one of said groups, and thereafter passes through the particles of the other of said groups.

8. A system as defined in claim 7; and further comprising a housing accommodating said particles of said groups and having an inlet located upstream the particles of said one group and an outlet located downstream of the particles of the second group.

ion exchange → blood

9. A system as defined in claim 1, wherein said particles of said groups are composed of crosslinked polymeric materials prepared by polymerization of monomers selected from the groups consisting of sterene ethylstyrene, α-methylstyrene, divinylbenzene, diisopropenylbenzene, trivinylbenzene, alkyl methacrylate as methyl methacrylate, and buthyl methacrylate.

10. A system as defined in claim 1, wherein said particles of said first group have positively charged function groups covalently bonded to a surface of pores of said particles of said first group and selected from the group consisting amino-, methylamino-, ethylamino-, dimethylamino-, diethylamino-, ethanolamino-, diethanolamino-, polyethylenimino-groups, imidazole, and histamine.

11. A system as obtained in claim 1, wherein said particles of said groups have a hydrophilic hemocompatible coating composed of a material selected from the group consisting of polyvinylpyrrolidone, polyhydroxyethyl methacrylate, carboxymethylcellulose, and polyurethane.